Caspian J. Env. Sci. 2006, Vol. 4 No. 2 pp. 142~ 146

[Research]

CJES
Caspian Journal of Environmental Sciences

Distribution of Freshwater Turtles in Punjab, Pakistan

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ABSTRACT
A total of 3528 specimens of freshwater turtles belonging to two families viz., Geoemydidae (Brown River Turtle, *Kachuga smithi*; Indian Saw-backed turtle, *K. tecta*; Brahminy Rrive Turtle, *Hardella thurgi;* Spotted Pond Turtle, *Geoclemys hamiltonii*) and Trionychidae (Indian Soft-shell Turtle, *Aspederates gangeticus*; Peacock Soft-shell Turtle, *A.hurum;* Narrow-headed Soft-shell Turtle, *Chitra indica;* Indian Flap-shell Turtle, *Lissemys punciata*) were identified. *Kachuga smithi* (43.62%) and *K.tecta* (42.06%) had abundant population status, whereas, *Hardella thurgi* (0.88%) and *Chitra indica* (0.54%) were rare. Capturing of turtles for supply to foreigners and export is a major threat to these animals. Fishermen also kill them during fishing. Canal closure and de-silting is also harmful to turtles. It is concluded that it is necessary to provide immediate legal protection/coverage to all turtle species under the Punjab Wildlife Act, 1974, Pakistan; otherwise turtle species will become extinct.

Keywords: Turtle, Population, Distribution, Species, Capturing, Rivers, Canals, Protection, and Management.

INTRODUCTION

The order Chelonia is in the class Reptilia and contains 13 recognized families. These include land tortoises, freshwater and marine turtles. There are about 289 living species of turtles and tortoises, which are found in different habitat of the world (Ernst *et al.* 2005).

Some genera are distributed very widely but others are restricted to icelands or small continental areas. Two families of freshwater turtles, namely, Geoemydidae and Trionychidae occur in the rivers of the Punjab, Pakistan. Turtle populations are being rapidly deleted as they are not protected or conserved by any Government Depart-ment in Pakistan. These animals do not have any legal protection/ coverage through any Law or Act. Consequently some species populations are becoming threatened. The Ganges soft-shell turtle, Peacock soft-shell turtle, Spotted pond turtle, and the Indian saw-backed turtle are included in Appendix-I, whereas, Indian flap-shell turtle is included in Appendix-II of the Convention on International Trade in Endangered Species (CITES) (Anonymous, 2005). The Indian Soft-shell Turtle, Brahminy Turtle and Smith's terrapin are non-CITES (Anonymous, 2005).

No research work has been conducted on freshwater turtles in Pakistan so basic data on occurrence and population distribution of different species is not available. Rubin *et al*. (1998) stressed that accurate knowledge about spatial distribution of a species or population is essential for effective management in the natural habitat.

The objective of this study was to determine the population distribution and status of freshwater turtle species in the Punjab (Pakistan) and to submit a proposal to Government to take appropriate decision regarding export of turtles on a sustainable basis and to provide legal protection to threatened species.

MATERIAL AND METODS

- Five rivers of the Punjab and seven irrigation canals were surveyed form 19 different points as shown in Table1 Fig. 1. These places were randomly selected for study, but were readily accessible. The stu-

dy was conducted from December 2003 to April 2004 using the flowing procedure.

- Basking turtles were observed, directly counted and different species were identified with the help of Binocular Minolta (10x50 mm).
- No turtle was found basking during severe cold weather conditions so drag net was used for capturing of turtles. Netted animals were counted; their species identified and then released back into the same water.
- Canals were surveyed, during canal closure season, by walking in dry canals following the flipper prints of turtles. Animals found above ground in the dry canal were identified to species and counted, whereas the animals hibernated / buried in dried canal bed were removed from the bed, identified and counted.
- A third method used baited hooks to capture turtles and was particularly good for catching soft-shell turtles. Steel hooks were baited with intestine of poultry. After species identification and counting, turtles were released back in their natural habitat. For species identification Minton (1966) was followed.
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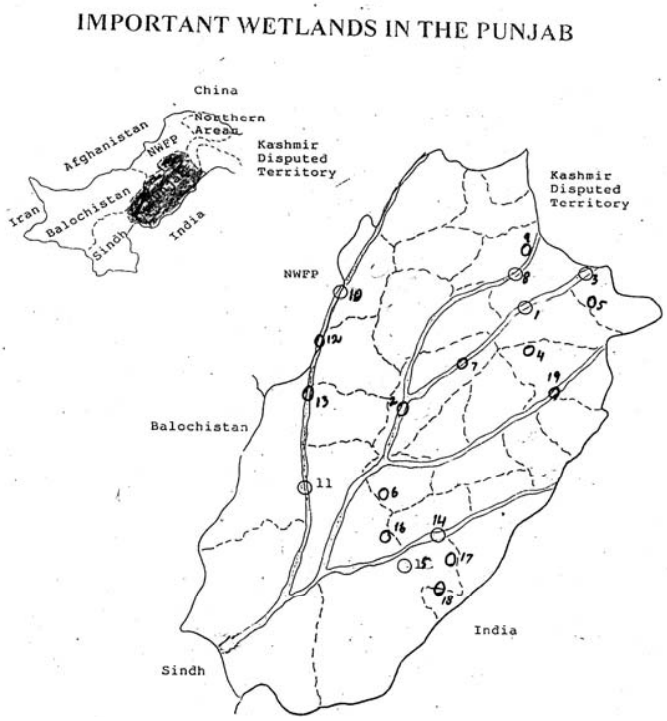

Fig. 1 The study region with the sampling sites of Fresh water turtle in Punjab, Pakistan

Site #	Name of Locality	Site #	Name of Locality	Site #	Name of Locality
1	Head Qadirabad (chenab)	2	Head Trimmu (Chenab)	3	Head Marla (chenab)
4	Qadierabad-Balloki link canal (Chenab)	5	Upper Chenab canal (Chenab)	6	Rangpur canal (Chenab)
7	Chinot river (Chenab)	8	Head Rasool (Jhelum)	9	Sangoi area river (Jhelum)
10	Chasma Barrage (Indus)	11	Taunsa Barrage (Indus)	13	Kallorkot river (Indus)
14	Head Islam (Satluj)	15	Qaim canal (Satluj)	16	Pakpattan canal (satluj)
17	Fordwah canal (Satluj)	18	Sadiqia canal (Satluj)	19	Head Balloki (Ravi)

RESULTS AND DISCUTIONS

A total of 3528 individual turtles belonging to two families viz., Geoemydidae (Brown River Turtle, *Kachuga smithi*; Indian Saw-backed turtle, *K. tecta*; Brahminy Rrive Turtle, *Hardella thurgi;* Spotted Pond Turtle, *Geoclemys hamiltonii*) and Trionychid-ae (Indian Soft-shell Turtle, *Aspederates gangeticus*; Peacock Soft-shell Turtle, *A.hurum;* Narrow-headed Soft-shell Turtle, *Chitra indica;* Indian Flap-shell Turtle, *Lissemys punciata*) were identified (Table 1).

Table 1. Population Distribution of Freshwater Turtles in the Punjab (Pakistan).

Sr#.	Name of Locality (River)	Date of Survey	Approx. area Surveyed (km)	Number of animals observed								Total	%
				K. smithi	*K. tecta*	*H. thurgi*	*G. hamiltoni*	*A. gangeticus*	*A. hurrum*	*C. indica*	*L. punctata*		
1	Head Qadirabad (Chenab)	31-12-03 & 07-03-04	9	114	149	0	1	22	16	0	0	302	8.56
2	Head Trimmu (Chenab)	23-01-04 & 29-03-04	3	572	588	31	3	27	15	2	0	1238	35.09
3	Head Marala (Chenab)	13 & 14-01-04	1	12	18	0	6	6		0	0	42	1.19
4	Qadirabad-Balloki link canal (Chenab)	30-12-03	30	7	12	0	0	7	1	0	7	34	0.96
5	Upper Chenab canal (Chenab)	12-1-2004	20	20	16	0	1	8	1	0	27	73	2.07
6	Rangpur canal (Chenab)	29-03-04	1	26	40	0	0	6	4	0	0	76	2.15
7	Chiniot, river (Chenab)	23 & 24-12-03	1	1	4	0	0	3		0	8	16	0.45
8	Head Rasool (Jhelum)	02-01-04 & 09-03-04	2	5	7	0	0	6	3	0	3	24	0.68
9	Sangoi area, river (Jhelum)	10-3-2004	1	12	15	0	0	12	8	1	7	55	1.56
10	Chashma Barrage (Indus)	13-02-04 & 26-03-04	5	139	119	0	46	27	10	2	0	343	9.72
11	Taunsa Barrage (Indus)	20-12-03 & 28-03-04	3	347	284	0	1	27	16	5	0	680	19.27
12	Kallorkot, river (Indus)	14-02-04	3	77	69	0	0	18	6	0	0	170	4.82
13	Dera Ismail Khan, river (Indus)	15-02-04 & 27-03-04	10	95	68	0	4	51	26	1	0	245	6.94
14	Head Islam (Satluj)	15-01-04	1	3	5	0	0	1	0	0	0	9	0.26
15	Qaim canal (Satluj)	15-01-04	0.5	4	2	0	0	1	0	0	0	7	0.20
16	Pakpattan canal (Satluj)	17-01-04	0.5	3	2	0	0	1	0	0	0	6	0.17
17	Fordwah canal (Satluj)	17-01-04	0.5	4	2	0	0	1	0	0	0	7	0.20
18	Sadqia canal (Satlij)	17-01-04	0.5	3	4	0	0	1	0	0	0	8	0.23
19	Head Balloki (Ravi)	30-04-04	1	95	80	0	0	6	3	8	1	193	5.47
		Total >	93	1539	1484	31	62	231	109	19	53	3528	
		%		43.62	42.06	0.88	1.76	6.55	3.09	0.54	1.50		

The most abundant species found was *Kachuga smithi* (43.62%) followed by *Kachuga tecta* (42.06%). The status of *Hardella thurgi* and *Chitra indica* was rare (0.88% and 0.54%, respectively), whereas the status of *Geoclemys hamiltonii* (1.76%) *Aspederates hurum* (3.09%) and *Lissemys punciata* (1.50%) frequent. *Aspederates gangeticus* was common (6.55%). Ofall the sites sampled, the breatest numbers and species diversity was recorded at Head Trimmu (35.09% of all captures) belonging to seven different species. It is the place where two rivers i.e., Chenab and Jhelum join together. Maximum population was recorded in Rangpur canal, which flows from Head Trimmu (2.15%) (Table 1).

Khan (1999) reported the distribution of *Agrionemys horsfedii* in Balochistan and not in Punjab. During the present study it was again not recorded in the Punjab. Suwelo (2001) reported that the tortoises, terrapins and turtles of Southeast Asia have been harvested from the wild for a wide range of purposes, primarily for food and traditional Chinese medicine, but also for pets and to release in Buddhist sites in temples. Jetkins (1995) reported that in recent years the trade has escalated and changed dramatically. Once predominantly for local consumption, the harvest is now motivated by international demand, primarily in East Asia and particularly mainland China. A dramatic increase in exports to Mainland China dates from the time when the Chinese currency became convertible.

During our study some threats to turtles population was also recorded which are given below in order of their magnitude.

1. Freshwater turtles do not have any legal protection coverage through any provincial Act; therefore, they are being captured in thousands for supply to foreigners living in Pakistan and to illegal export for supply to abroad. Reports of capturing turtles on large scale were received from Chashma Barrage, Taunsa Barrage, Head Qadirabad, Head Rasool, Head Trimmu, Head Balloki and Chiniot area.

2. Fishermen also capture turtles during fishing with nets and angling. Some turtles are accidentally killed with nets, whereas some fishermen considered them the enemies of fish, therefore, they kill the captured turtles to save their fish. During the study 11 dead bodies of *Kachuga smithi*, 5 of *K. tecta*, 32 of *Geoclemys hamiltanii* and 4 of *Aspederates gangeticus* were observed at Indus riverbank near Kundian.

3. Dogs were observed wondering extensively during canal closure in search of food. These dogs eat dead fish, trapped fish and turtles in shallow water. Dead bodies of spotted pond turtles and Indian soft-shell turtles were observed which were being eaten by such dogs.

4. During fish capturing operations by local peoples turtles are also captured and occasionally killed.

5. Hibernated turtles are either killed of removed from their natural habitat and shifted with silt where their lives are on risk during de-silting of canals.

6. Running water maintains body temperature of turtles. Turtles face severe cold condition due to unavailability of water and shortage of food which is harmful to turtles when canals are closed.

It was concluded that freshwater turtles are a very important natural recourse of the country, which are being ignored and wasted. To manage this situation and preserve turtle populations into future, it is necessary to provide legal protection/ coverage immediately under the Punjab Wildlife (Protection, Conservation, Reservation and Management) Act, 1974, otherwise this natural resource will be destroyed by the local peoples and species will ultimately become extent.

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